Objective: Students will construct a cladogram using descriptions and information about 7 imaginary animals. Students will determine which traits are derived traits, and identify synapomorphy and automorphy of characteristics.

Tips for constructing your cladogram:

1. Use the times to determine the positioning of the species. Older organisms will appear first on the cladogram
2. Determine features that are shared among organisms - these are synapomorphies - Place an S on these features to help you keep track
3. Determine features that are unique to organisms - these are automorphies - Place an A on these features
4. There may be several ways to represent this cladogram, remember that cladistics and systematics is inexact, do not worry if yours looks different from others.

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| Description of Species | Picture |
| Species 1 - Fossils of this species date back to 30,000 years ago. The organism has a single antenna that is branched (like a Y). It has two eyes positioned on top of the head a non segmented body | species1 |
| Species 2 - Fossils of this species date back to 8,000 years ago. This organism has branched antennae, 3 body segments, the middle segment has fleshy appendages with a bendable joint. | species2 |
| Species 3 - Fossils of this species date back to 25,000 years ago. The organism has a branched antenna (like a Y), body is divided into 2 segments, and eyes positioned on the top of the head. In addition, the last segment of the body has a long curley tail. | species 3 |
| Species 4 - Fossils of this species date back to 10,000 years ago. This organism has branched antennae, 2 body segments, eyes positioned on the top of the head, fleshy appendages on the last segment have a bendable joint. | species5 |
| Species 5 - Fossils of this species date back to 50,000 years ago. The organism has a single antennae, two eyes positioned on top of a head and a non segmented body. | species5 |
| Species 6 - Fossils of this species date back to 20,000 years ago. This organism has branched antennae, 2 body segments, eyes positioned on the top of the head, and small flesh appendages on the last segment. This organism also has a ridge of spines on the last segment. | species6 |
| Species 7 - Fossils of this species date back to 31,000 years ago. The organism has a single branched antennae (like a Y) and a club like structure at the end of the branches of the antennae. It has two eyes positioned on top of the head and a non segmented body. | species7 |